

Outstanding value in a high-performance dual-core single-socket tower server



## Sales Guide

February 2008

# IBM System x3100

## Product Overview

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## Outstanding price/performance in a value tower server

**Suggested uses:** *Small and medium businesses looking for technology to help improve business efficiency.*

Often small-to-medium sized businesses have limited IT budget and resources, and rely on partners or multi-talented employees to help manage the company's network. Business needs for efficiency improvement and retention of critical data require the use of a server that is easy to get up and running quickly and is dependable. You need to squeeze as much as possible out of your IT dollars, while saving cost on features not desired in an SMB environment. The IBM® **System x3100** is an ideal first server to meet those business needs. It was built for speed, yet eliminates costly design features found in general-purpose servers that are unnecessary for smaller businesses.

The single-socket x3100 supports powerful **dual-core** Intel **Xeon** and **Pentium** processors, to offer impressive computing power in a **minitower** design that can fit under a desk. It offers up to **8GB**<sup>1</sup> of industry-standard enterprise-class **667MHz DDR2 (PC2-5300)** memory with **ECC** (Error Checking and Correcting) protection—for high performance and reliability. An integrated high-speed **Gigabit Ethernet** controller is standard, as are **two** high-performance/low-latency **PCI-E** adapter slots.

All models offer impressive scalability for an entry server, including an internal storage capacity of **1.5TB**<sup>2</sup> (via **two** 3.5-inch fixed enterprise-class **750GB SATA II** drives) and support for **RAID-0/1** data protection through the operating system. The optional IBM **ServeRAID-MR10M** controller provides hardware-based support for external SAS/SATA storage (**RAID-0/1/10/5/50/6/60** support). Alternatively, for enhanced data protection and performance, the optional IBM **SAS HBA Controller** provides hardware-based internal SATA **RAID-0/1** support, as well as support for external SAS/SATA and internal/external tape storage. In addition, for disaster recovery, the x3100 supports internal or external **tape drives** or a **GoVault EZ** removable disk drive.

With the inclusion of advanced features, such as **temperature-controlled fans**, and unique IBM service and support features, such as **IBM Director Agent** and **IBM ServerGuide™**, the x3100 is designed for superior uptime.

If you need single-socket/dual-core computing price/performance in a budget tower package, the x3100 is the ideal system.

## Selling Features

## Price/Performance

The x3100 offers numerous features to boost performance and reduce product and operating costs:

- The choice of a low-cost **dual-core Pentium** processor or a robust **server-class dual-core Xeon** processor offers superior performance capable of tackling the toughest jobs. **64-bit extensions** provide the flexibility to run 32-bit and 64-bit applications concurrently.
- **Energy-efficient 65W processors** draw less power and produce less waste heat than high-wattage processors, thus helping to reduce your energy costs.
- Ultra-fast server-class **667MHz PC2-5300 DDR II ECC** memory provides speed and high availability.
- **Two high-speed PCI-E adapter slots** offer investment protection by supporting high-performance adapters, such as 10Gb Ethernet, Fibre Channel and InfiniBand cards.
- Up to **two** 3.5-inch enterprise-class **SATA II** hard disk drives offer terrific price/performance (incorporating **3Gbps** throughput).

<sup>1</sup> Maximum memory and disk capacity may require the replacement of standard components with the largest supported component available. **8GB** capacity is achieved using four **2GB** DIMMs.

<sup>2</sup> GB equals 1,000,000,000 bytes when referring to hard disk drive capacity. Accessible capacity may be less.

- The integrated **Gigabit Ethernet** controller provides high-speed network communications.
  - A **high degree of device integration**—including SATA, Gigabit Ethernet, and video controllers—lowers costs and frees up valuable adapter slots.
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## Flexibility

The x3100 has the ability to grow with your application requirements, thanks to:

- A choice of processors with **2.33GHz Xeon** or **1.6GHz Pentium** processor with **65W** maximum power draw and **1333MHz** or **800MHz** front-side bus (respectively).
  - Up to **8GB** of high-speed DDR2 system memory in **four** DIMM sockets.
  - **Two available high-performance PCI-E** slots and **two available** 32-bit **PCI** slots (for legacy adapters) in all models.
  - A choice of up to **two** internal **3.5-inch** fixed **SATA II** HDDs offer low-cost/high-capacity enterprise-class storage. The 3.5-inch drives provide a maximum of **1.5TB** of internal storage. External direct-attached IBM **SAS/SATA** devices can be used, for terabytes of additional storage capacity. (Requires an optional IBM ServeRAID or SAS HBA controller.)
  - An **available 5.25-inch** drive bay supports either a **half-high tape drive** or a **GoVault EZ** removable disk drive, for cost-effective data backup. A **dedicated 3.5-inch drive** is reserved for a tape drive.
  - The half-length **PCI SAS HBA** controller provides **RAID-0/1** support for *internal* SATA hard disk drives and **RAID-0/1/1E** for *external* SAS/SATA and tape drives.
  - The **six external USB 2.0** ports are up to **40X** faster<sup>3</sup> than older **USB 1.1** ports. This provides speedy access to external HDDs (non-arrayed), optical drives, tape drives, and other USB devices. Two ports are on the front of the unit and four are on the back. In addition, there is **one internal USB 2.0** port for use with a tape drive.
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## Manageability

Powerful systems management features simplify local and remote management of the x3100:

- **IBM Director Agent** is provided for proactive systems management. It allows a remote IBM Director-equipped server to monitor and control systems management functions on the x3100.
  - **IBM ServerGuide** simplifies the process of installing and configuring System x and xSeries servers, by assisting with the automated installation of the Microsoft® Windows® Server 2000 and 2003 operating systems, device drivers and other system components, with minimal user intervention.
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## Availability and Serviceability

The x3100 provides many features to simplify serviceability and increase system uptime:

- **Server-class components**, including the processor, memory, chipset, power supply, and others, are built for the rigors of an “always-on” environment. This helps reduce the risk of failure and life cycle costs.
  - **ECC memory** provides error correction not available in PC-class “servers” that use parity memory. Avoiding system crashes (and data loss) due to soft memory errors can mean greater system uptime.
  - **Toolless cover removal** provides easy access to upgrades and serviceable parts. Similarly, adapters can be installed and replaced without tools. This can mean less time (and therefore less money) spent servicing the x3100.
  - **Temperature-controlled fan** adjusts to compensate for changing thermal characteristics. At the lower speeds it draws less power and suffers less wear. Also important in an office environment, temperature-controlled fans produce less ambient noise than if they were constantly running at full speed.
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## Key Features

### High-Performance Dual-Core Processors

The x3100 supports one high-performance Intel Xeon or Pentium processor, as your business needs require. The x3100 offers a choice of processor clock rates, and front-side bus speeds:

- **65W dual-core** Intel Xeon **3065** at 2.33Ghz, with 64-bit extensions, **1333MHz** FSB, **4MB** of shared L2 processor cache, and low power draw (**32.5W** per core)
  - **65W dual-core** Intel Pentium **E2140** processor operating at 1.6GHz, with 64-bit extensions **800MHz** FSB, **1MB** of shared L2 processor cache, and low power draw (**32.5W** per core)
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<sup>3</sup> Data transfer rates may be less than the maximum possible.

**Dual-core** processors contain **two complete processor cores**. They contain one **unified cache shared** by both cores. The shared cache is dynamically allocated between the cores as needed. The multiple cores appear to software as multiple physical processors. Dual-core processors offer considerably higher performance than a same-speed processor with a single core.

Intel **Extended Memory 64 Technology (EM64T)** 64-bit extensions allow the Xeon processor to use large memory addressing when running with a 64-bit operating system. This in turn lets individual software processes directly access more than 4GB of RAM, which was the limit of 32-bit addressing. This can result in much higher performance for certain kinds of programs, such as database management and CAD. Additional registers and instructions (SSE3) can further boost performance for applications written to use them. Contact your software providers to determine their software support for EM64T.

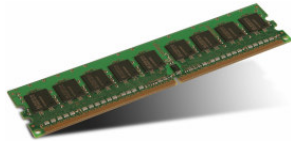
The **1333MHz FSB** offers a peak rate of **10.67GBps**, or up to **two-thirds** higher throughput at the same processor clock speed than an **800MHz FSB**. This may result in much higher data transfer rates.

**Intelligent Power Capability** powers individual processor elements on and off as needed, to reduce power draw.

**Execute Disable Bit** functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.

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### High-Speed DDR II ECC Memory



The x3100 supports up to **8GB** of memory using **4 DIMM** slots. It uses unbuffered **PC2-5300** double data rate II (DDR2) memory (operating at **667MHz**) for fast access, and provides ECC memory protection.

The x3100 supports either **1, 2, or 4 DIMMs**. When 2 or 4 DIMMs are installed, memory operates in **two-way interleaved** mode for increased performance.

Memory is available in kits consisting of *one 512MB* or *two 1GB or 2GB* DIMMs.

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### Drive Bays



The x3100 contains **five** drive bays in all. All models offer **two 3.5-inch** bays that support fixed **SATA II** drives. This enables up to two slimline (1.0") drives to be installed, totaling up to **1.5TB**.

A **5.25-inch** bay contains a **48X/16X<sup>4</sup>** speed (ultraslim, 0.5") **DVD-ROM/CD-ROM** Combo drive, with a SATA interface. A **second 5.25-inch** bay is available for a **half-height tape** drive, or a **GoVault** removable disk drive. A **3.5-inch** bay is provided as well for an optional backup device. An optional *external* USB floppy drive may be used, if needed.

For additional storage, a direct-attach FC SAN, or iSCSI external expansion option can be added, using an optional controller.

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### Large HDD Storage Capacity



The x3100 offers a choice of disk storage, supporting up to **two 3.5-inch** fixed **SATA** drives:

- **7,200 RPMs** —160, 250, 500 or **750GB** (**1.5TB** maximum capacity)

**Note:** Enterprise-class 500GB+ SATA drives offer higher reliability and higher performance compared to lower-capacity SATA drives.

If you need more storage space, terabyte capacities are possible with external direct-attach, NAS and SAN solutions.

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### Disk Controllers

All x3100 models include an integrated SATA II controller. It provides data transfer speeds of up to **3Gb** per second<sup>5</sup> across the SATA bus.

Optionally, the **half-length PCI-E IBM SAS HBA Controller** provides **RAID-0** (striping) and **RAID-1** (mirroring) support for internal **SATA** HDDs and tape drives. For external storage, this controller enables RAID-0/1 support, as well as **RAID-1E** (mirroring with an odd number of drives) for external SAS/SATA storage and tape drives.

For higher-end storage, the **ServeRAID-MR10M** PCI-E x8 controller enables connection to external SAS/SATA storage. It provides **RAID-0/1/10/5/50/6/60** support and **256MB** of onboard cache for high performance.

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<sup>4</sup> Variable read rate. Actual playback speed varies and is often less than the maximum possible.

<sup>5</sup> Data transfer rates depend on many factors and are often less than the maximum possible.



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## High-Performance Adapter Slots

The x3100 provides **two PCI-E (PCI Express) adapter slots** standard. **Slot 2** is a **x8** ("by 8") **4GBps** slot. **Slot 1** is a **x8** ("by 8") *mechanical* slot supporting **x4 (2GBps) throughput**. Each is capable of supporting **x1/x4/x8** physical adapters<sup>6</sup>. **Slot 2** is a **full-length/full-height** slot; **Slot 1** is **half-length/full-height**. In addition, there are **two 32-bit/33MHz PCI full-size slots (3 and 4)** to support legacy adapters.

**PCI Express** is a high-performance, low-latency, next-generation serial I/O bus that is rapidly replacing the older parallel PCI and PCI-X buses. A **x8PCI-E** adapter offers approximately *four times* the maximum throughput of a 133MHz PCI-X adapter<sup>7</sup>. (A **x1** adapter offers throughput similar to a 64-bit **66MHz** PCI-X slot.)

Because the **SATA**, **Gigabit Ethernet** and **video** controllers are integrated onto the system board, all five adapter slots are *available*, which offers a wide degree of latitude in expansion options.

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## Internal Backup

The x3100 supports internal **half-high backup** options. Supported technologies include:

- **DDS-6**
- **GoVault EZ**

External tape backup support is available using the optional IBM SAS HBA Controller.



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## Gigabit Ethernet Controller

The x3100 includes an integrated **Intel 82566DM** Gigabit Ethernet controller for up to 10X higher maximum throughput than a 10/100 Ethernet controller.

It also supports **Wake on LAN**<sup>®</sup> and **PXE** (Preboot Execution Environment) flash interface. Optional PCI adapters offering failover and load balancing between adapters are available for added throughput and increased system availability.

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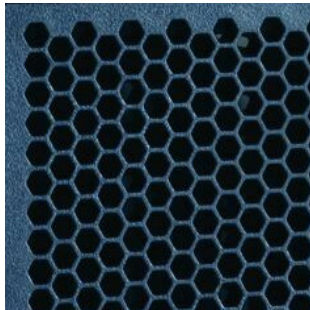
## Efficient Cooling

A strategically located fan, combined with efficient airflow paths, provide highly effective system cooling for the x3100. The server includes one non-hot-swap fan. In addition, the power supply contains a fan.

The fan automatically adjusts speeds in response to changing thermal requirements, from minimum RPMs to maximum RPMs, depending on the internal temperature. When the temperature inside the server increases, the fan speeds up to maintain the proper ambient temperature. When the temperature returns to a normal operating level, the fan returns to its default speed. Why not simply run the fan at 100% capacity all the time? For several good reasons: to reduce the ambient noise, reduce the wear-and-tear on the fan and reduce the server power draw. The reduction in ambient noise and power draw may be relatively minor for a single server, but put several in an office and it can make a significant difference.

In addition, the server uses **hexagonal ventilation holes** in the chassis. Hexagonal holes can be grouped more densely than round holes, providing greater airflow through the system cover.

This cooling scheme is important because newer, more powerful processors generate a significant amount of heat, and heat must be controlled for the system to function properly.



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## Other Features

- **Seven USB 2.0 ports** — Provides flexibility to add high-speed external devices. The USB 2.0 specification supports up to 480Mbps transfer rates. (**Note:** Not all USB 2.0 devices are capable of achieving this rate.) **Two** ports are provided on the front of the server and **four** on the back. In addition, **one internal** port is available to support a USB tape drive.
- **Toolless chassis** — The cover can be opened without tools, and many components can be added, removed, and replaced without tools, including memory DIMMs, the processor, the optical drive and PCI-E adapters. This can save significant servicing time.

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<sup>6</sup> A x8 slot will accept x1, x4, and x8 adapters running at full rated speed; a x4 slot will accept x1, x4, and **x8** adapters operating at a maximum of **x4** throughput.

<sup>7</sup> Actual throughput will depend on the adapter vendor's implementation.

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## Extensive System Support Features

The IBM services and technical support portfolio provides world-class, consistent, high-quality service and support. The x3100 server offers a number of tools and services designed to make ownership a positive experience. From the start, IBM programs make it easier for you to plan for, configure and purchase System x or xSeries servers, get them running and keep them running long-term. These features include IBM ServerProven<sup>®</sup>, IBM ServerGuide, IBM Electronic Service Agent<sup>™</sup>, and extensive technical support offerings.



The IBM **ServerProven** program provides the confidence that specific options and operating systems have been tested on the server and are officially supported to work together. It is updated frequently to ensure that the latest compatibility information is always at your customers' fingertips.

IBM **ServerGuide** (installed from CD) simplifies the process of installing and configuring System x and xSeries servers. ServerGuide goes beyond mere hardware configuration by assisting with the automated installation of the Microsoft<sup>®</sup> Windows<sup>®</sup> Server 2000 and 2003 operating systems, device drivers and other system components, with minimal user intervention. (Drivers are also included for support of Novell NetWare, Red Hat Linux and SUSE LINUX.) This focus on deployment helps you reduce both your total cost of ownership and the complexity that administrators and technical personnel face.

IBM **Electronic Service Agent**<sup>™</sup> is an innovative "call home" feature that allows System x and BladeCenter servers to automatically report hardware problems to IBM support, which can even dispatch onsite service<sup>8</sup> if necessary to those customers entitled to onsite support under the terms of their warranty or an IBM Maintenance Agreement. Electronic Service Agent resides on a server and provides electronic support and problem management capabilities through a highly secure electronic dialogue between your systems and IBM. It monitors networked servers for hardware errors and it can perform hardware and software inventories and report inventory changes to IBM. All information sent to IBM is stored in a highly secure database and used for improved problem determination.

IBM offers extensive **technical support** by phone and via the Web. Support options include links to forums/newsgroups, problem submission, online shopping support, service offerings, device drivers for all IBM product lines, software downloads and even upcoming technical seminar worldwide schedules and registration. Also available are remote installation, configuration and usage support for System x and xSeries hardware and software, as well as onsite custom services to provide the level of expertise you require.

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## Advanced Systems Management Capabilities

The x3100 has systems management capabilities that are well-suited to SMBs. Features include the Automatic Server Restart, Wake on LAN<sup>®</sup> support, PXE support, and IBM Director Agent.

**Automatic Server Restart (ASR)** helps reduce downtime by restarting the server automatically in the event of a system lockup. ASR technology is a combination of hardware circuitry tied into the server's system reset function and a device driver. As long as the server continues running, the ASR watchdog timer will keep being reset, but if the operating system crashes or the hardware freezes somehow the ASR software will be unable to reset the hardware timer. If the timer is not reset within five minutes, it automatically triggers the ASR hardware, which immediately restarts the server (and logs an ASR event). These features are designed so that *no more than five minutes can pass before the server is restarted*.

**Wake on LAN** permits the server to be remotely powered on if it has been shut off. Once powered up, the server can be controlled across the network, using the **Preboot Execution Environment (PXE)**.

Like Wake on LAN, PXE is system firmware. It enables software to take control of a system before the BIOS, operating system or applications are loaded (using Wake on LAN/PXE) and lets an administrator perform many low-level tasks remotely that would otherwise require a visit to each system. These tasks may include such things as formatting a hard disk drive, updating system firmware, or deploying a Windows or Linux operating system.

**IBM Director Agent** software for advanced workgroup management is included with the x3100.

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## Key Options

### IBM options for System x servers help you take your servers to a higher level

You can rely on System x options to supply a complete solution for your business needs. Options help create an optimized server system to meet your data protection, storage and availability needs. Every IBM option is designed and tested for peak performance and flexibility, helping to

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<sup>8</sup> For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician.



maximize your return on investment. The combination of System x servers and options lets you keep your fingers on the pulse of your e-business.

**Memory** — Memory is a significant factor in systems application performance. Adding more memory to a System x server is one of the most effective ways to increase application performance. For best performance in a server with a dual-core processor, there should be twice as much memory available as for a single-core processor. The x3100 provides two-way interleaving.

**Hard Disk Drives** — IBM hard disk drives help you improve the transaction and cost performance of your System x servers. The choice of hard disk drives can be a critical aspect of maximizing the I/O throughput of the system. **SATA II** hard disk drives are available for the x3100 with capacities up to **750GB** (3.5-inch) apiece at **7,200** RPMs.

**RAID Controllers** — RAID technology allows an array consisting of multiple physical hard disk drives to be treated as one logical drive. RAID technology also allows data to be stored redundantly, across multiple hard disk drives—enhancing both the integrity and the availability of the data. RAID controllers offer enhanced performance due to onboard processors and cache. Because RAID controllers can help significantly improve data transfer rates, this technology is extremely effective when implementing demanding, transaction-oriented applications. By employing the advanced fault tolerance of RAID technology, companies can effectively implement networked business systems that require large amounts of storage space for data and applications that must be available for their businesses to continue operating.

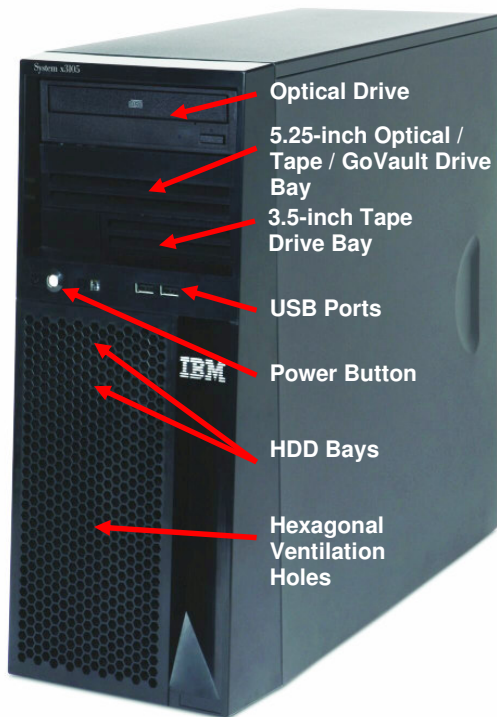
The optional **half-length PCI-E IBM SAS HBA Controller** offers **RAID-0/1/1E** support for internal SATA HDDs. This controller also supports the external IBM System Storage DS3000 and internal/external tape drives.

The optional **ServeRAID-MR10M** PCI-E x8 controller offers high performance and **256MB** of cache memory with battery backup for *external* SAS/SATA storage capacity. The adapter supports **seven** RAID levels: **0, 1, 10, 5, 50** (RAID-5 across multiple arrays), **6** (double parity) and **60** (RAID-6 across multiple arrays).

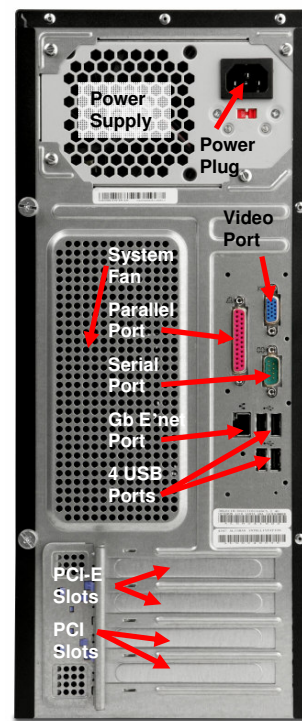
External FC SAN storage is available using one of several IBM host bus adapters. Additionally, external LAN-attached tape storage is available.

## x3100 Images

### Front View

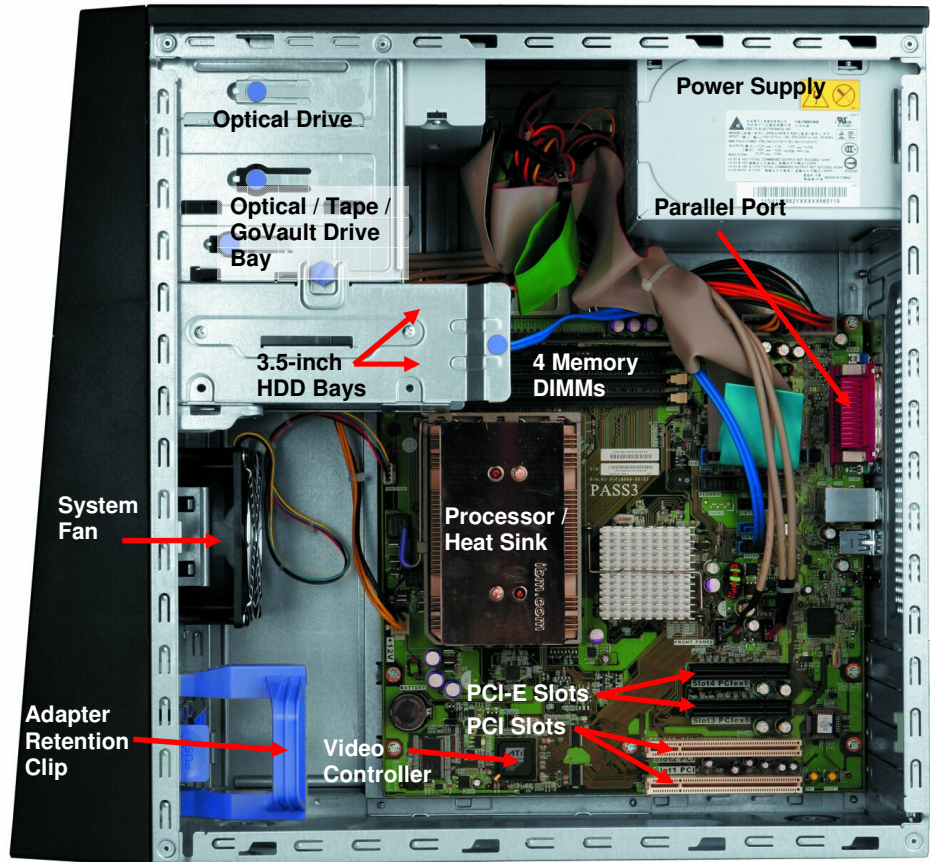


### Rear View



Outstanding value in a high-performance dual-core single-socket tower server

## Interior View



<b>x3100 Specifications</b>		
Machine type	4348-2xX/2xY, 4xX/4xY	
Form factor	5U tower (optional rack kit)	
Processor type	Dual-core Xeon (30xx) 2.33GHz 3065 (4xX/4xY)	Dual-core Pentium (E21xx) 1.6GHz E2140 (2xX/2xY)
Maximum processor power draw	65W	
Front-side bus speed	1333 MHz (4xX/4xY)	800MHz
# of processors standard / maximum	1 / 1	
Internal L2 cache	4MB (shared)—4xX/4xY	1MB (shared)—2xX/2xY
Chipset	Intel 3200	
Standard memory <sup>9</sup>	512MB (1 x 512MB)—2xX/2xY	1GB (1 x 1GB)—4xX/4xY
Maximum memory	8GB (4 x 2GB DIMMs)	
Standard memory type	Unbuffered PC2-5300 (667MHz) DDR II ECC	

<sup>9</sup> Maximum memory and disk capacity may require the replacement of standard components with the largest supported component available.

*Outstanding value in a high-performance dual-core single-socket tower server*

<b>x3100 Specifications</b>	
<b>Memory interleaving</b>	Yes (two-way, with 2 or 4 DIMMs)
<b>DIMM capacities supported</b>	512MB, 1GB, 2GB
<b># of DIMM sockets total / available</b>	4 / 3
<b># of DIMMs supported</b>	1, 2, or 4
<b>Chipkill protection supported</b>	No
<b>Online spare memory supported</b>	No
<b>Memory mirroring supported</b>	No
<b># of drive bays total / available</b>	5 / 3 (optical/HDD installed)
<b># of 3.5-inch HDD drive bays total / available</b>	2 / 1 (3.5-inch)
<b># of 3.5-inch backup device bays total / available</b>	1 / 1
<b># of 5.25-inch bays total / available</b>	2 / 1 (optical drive installed)
<b>Maximum HDD capacity</b>	<b>1.5TB</b> (2 x 750GB) fixed <b>SATA II</b>
<b>HDD capacities supported</b>	3.5-inch SATA 160, 250, 500, <b>750GB</b> — <b>7,200</b> RPMs
<b># of HDDs standard</b>	1 x <b>160GB</b> SATA
<b># of optical drives standard</b>	1 SATA <b>DVD-ROM/CD-ROM Combo</b> (48X/16X, in dedicated 5.25" bay)
<b># of diskette drives standard</b>	None (optional USB)
<b>Internal backup supported</b>	1 <b>half-high</b> (5.25-inch or 3.5-inch) <b>DDS-6</b> tape drive (SATA); or 1 <b>GoVault EZ</b> (SATA)
<b>Internal backup standard</b>	None
<b>Disk drive technology</b>	Fixed SATA
<b>Integrated disk controller</b>	4-port SATA II (via processor chipset)
<b># of disk drives supported <i>per port</i></b>	1
<b>External disk drives supported</b>	Yes, via optional adapter
<b>Integrated RAID controller</b>	None (software RAID-0/1 provided via operating system)
<b>Optional RAID controllers supported</b>	<b>ServeRAID-MR10M</b> (256MB battery-backed cache)—external SAS/SATA; <b>SAS HBA Controller</b> —internal/external SAS/SATA
<b># of adapter slots total / available</b>	4 / 4
<b># of PCI-E x8/x8 slots (4GBps)<sup>10</sup></b>	1 full-height/full-length
<b># of PCI-E x8/x4 slots (2GBps)<sup>11</sup></b>	1 full-height/half-length
<b># of 32-bit PCI 2.2 legacy slots</b>	2 full-height/full-length
<b># of video ports</b>	1 (rear)
<b>Video controller</b>	ATI Radeon ES1000
<b>Video memory</b>	32MB DDR2 SDRAM
<b>Maximum video resolution at 32-bit color</b>	1024 x 768 x 32-bit color at 85Hz

<sup>10</sup> x8/x8 slots can accept x1, x4 or x8 adapters running at x1, x4 or **x8** throughput, respectively.

<sup>11</sup> x8/x4 slots can accept x1, x4 or x8 adapters running at x1, x4 or **x4** throughput, respectively.



<b>x3100 Specifications</b>			
<b>Gigabit Ethernet controller</b>	Intel 82566DM		
<b># of Gigabit Ethernet ports</b>	1 (rear)		
<b># of RS485 ports</b>	None		
<b># of serial ports</b>	1 (rear)		
<b># of parallel ports</b>	1 (rear)		
<b># of mouse ports</b>	None (USB-attached)		
<b># of keyboard ports</b>	None (USB-attached)		
<b># of USB 2.0 ports</b>	<b>6 external</b> ports (2 front, 4 rear); plus <b>1 internal</b> connector for tape drive		
<b>Integrated systems management controller</b>	No		
<b>Optional systems management adapter</b>	No		
<b>Light path diagnostics support</b>	No		
<b># of power supplies standard / maximum</b>	1 / 1		
<b>Hot-swap/redundant power supported</b>	No		
<b># of fans/blowers standard / maximum</b>	1 / 1 fan (plus one fan in the power supply)		
<b>Hot-swap/redundant fans supported</b>	No		
<b>Heat emitted: minimum / maximum BTUs per hour</b>	185 / 853 (model-specific)		
<b>Maximum altitude</b>	7,000 ft; 2,133 m		
<b>Operating temperature range</b>	50 – 95° F; 10 – 35° C (up to 3,000 ft / 914.4 m); 50 – 90° F; 10 – 32° C (3,000 ft to 7,000 ft / 914.4m to 2,133m)		
<b>Operating humidity range</b>	8-80%		
<b>Dimensions (HWD) / weight</b>	<table border="0" style="width: 100%;"> <tr> <td style="width: 60%; text-align: center;">                     16.4" (416mm) <b>H</b>                      6.9" (175mm) <b>W</b>                      16.9" (430mm) <b>D</b> </td> <td style="width: 40%; text-align: center; vertical-align: middle;">                     30.9 (minimum) – 37.5 <b>lb</b> (maximum)                      14 – 17 <b>kg</b> </td> </tr> </table>	16.4" (416mm) <b>H</b> 6.9" (175mm) <b>W</b> 16.9" (430mm) <b>D</b>	30.9 (minimum) – 37.5 <b>lb</b> (maximum) 14 – 17 <b>kg</b>
16.4" (416mm) <b>H</b> 6.9" (175mm) <b>W</b> 16.9" (430mm) <b>D</b>	30.9 (minimum) – 37.5 <b>lb</b> (maximum) 14 – 17 <b>kg</b>		
<b>Operating systems supported</b>	Microsoft Windows Server 2003 & R2 (Standard/Web/Enterprise Editions) 32/64-bit, Microsoft Small Business Server 2003 Standard Edition & R2, RHEL 4 32-bit, RHEL 5 32/64-bit, SLES 9 32-bit, SLES 10 32/64-bit		
<b>Length of limited warranty</b>	1 year (parts and labor) <sup>12</sup>		

### ***The Bottom Line***

The x3100 is an extremely powerful value system, incorporating leading-edge industry-standard features and adding IBM-unique innovations:

#### **Price/Performance**

- **Low-cost processor** — 1.6GHz dual-core Pentium processor
- **High-throughput processors** — 2.33GHz dual-core Xeon processor
- **Large cache** — 4MB of L2 processor cache in Xeon processor
- **64-bit extensions**

<sup>12</sup> For terms and conditions or copies of the IBM Statement of Limited Warranty, call 800-772-2227 in the U.S. In Canada call 800-426-2255. IBM makes no representation or warranty regarding third-party products or services including those designated as ServerProven or ClusterProven. Telephone support may be subject to additional charges. For warranties including onsite labor, a technician is sent after IBM attempts to resolve the problem remotely. International warranty service is available in any country in which this product is sold.

- **Fast front-side bus** — High-speed (**1333MHz**) access between the Xeon processor, memory and I/O controllers
- **Fast memory** — **667MHz PC2-5300 DDR II ECC** memory standard with **two-way interleaving**
- **Fast disk technology** — Integrated high-speed (3Gbps) **SATA II** controller and drives
- **Fast communications** — Integrated **Gigabit Ethernet** controller
- **Fast I/O** — Two **PCI-E** adapter slots

**Flexibility**

- **Large memory capacity** — **8GB** of **667MHz DDR2 memory**, using **4 DIMMs**
- **Large disk capacity** — Up to **1.5TB** of internal SATA storage
- Internal **tape** or **GoVault** removable backup storage
- **High-performance external expansion** — **Six** 480Mbps **USB 2.0** ports (two front, four rear), plus **one internal USB 2.0** port for tape backup
- Optional **RAID hardware support** for internal or external drives
- **Four available** adapter slots:
  - **Two** physical **x8 PCI-E** high-speed slots (one is x8 electrically and one is x4)
  - **Two** legacy 33MHz **PCI** slots in support of legacy adapters
- Integrated **DVD-ROM/CD-ROM** combo drive

**Manageability, Serviceability and Availability**

- **IBM Director Agent** systems management software
  - Optional **highly available RAID arrays**
  - **ECC memory protection**
  - **Efficient cooling**
  - **Toolless chassis**
-



## For More Information

IBM System x Servers	<a href="http://ibm.com/systems/x">ibm.com/systems/x</a>
Electronic Service Agent	<a href="http://ibm.com/support/electronic">ibm.com/support/electronic</a>
IBM System x and BladeCenter Power Configurator	<a href="http://ibm.com/systems/bladecenter/powerconfig">ibm.com/systems/bladecenter/powerconfig</a>
ServerProven Program	<a href="http://ibm.com/servers/eserver/serverproven/compat/us">ibm.com/servers/eserver/serverproven/compat/us</a>
Technical Support	<a href="http://ibm.com/server/support">ibm.com/server/support</a>
Other Technical Support Resources	<a href="http://ibm.com/servers/eserver/techsupport.html">ibm.com/servers/eserver/techsupport.html</a>
Configuration and Options Guide	<a href="http://ibm.com/servers/eserver/xseries/cog">ibm.com/servers/eserver/xseries/cog</a>

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MB, GB and TB = 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, when referring to storage capacity. Accessible capacity is less; up to 3GB is used in service partition. Actual storage capacity will vary based upon many factors and may be less than stated.

Performance is in Internal Throughput Rate (ITR) ratio based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will depend on considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput improvements equivalent to the performance ratios stated here.

Maximum internal hard disk and memory capacities may require the replacement of any standard hard drives and/or memory and the population of all hard disk bays and memory slots with the largest currently supported drives available. When referring to variable speed CD-ROMs, CD-Rs, CD-RWs and DVDs, actual playback speed will vary and is often less than the maximum possible.